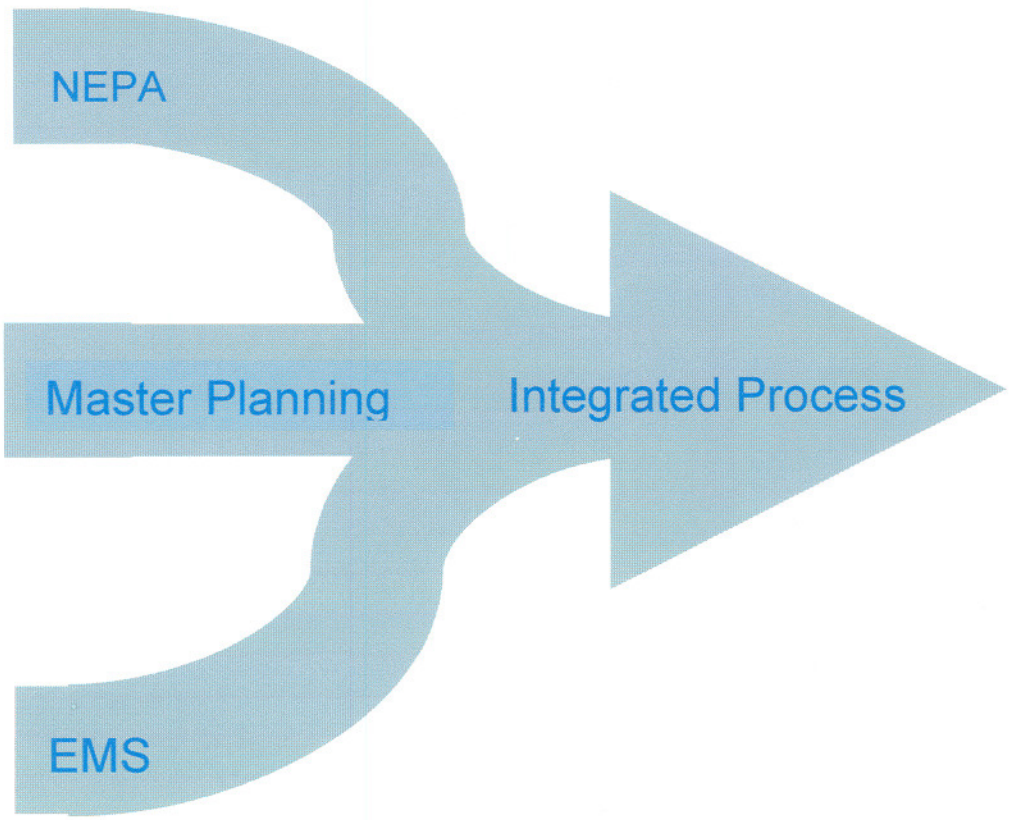
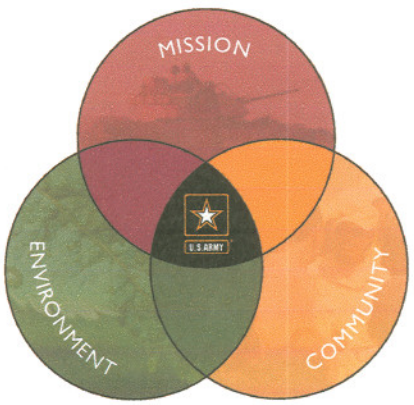
AEPI Report

Procedural Integration In Support of Sustainability at Army Installations





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EXECUTIVE SUMMARY

The *Army Strategy for the Environment*, (ASA (I&E), 2004), sets a new tone for the Army Environmental Program. The Army will "transition from a compliance-based environmental program to a mission-oriented approach based on the principles of sustainability" (p. 1). Although principles and concepts of sustainability and sustainable development are becoming increasingly clear and accepted both in the Army and throughout policy circles, the methods and tools designed to enable movement toward sustainable communities, regions or installations are not. The Army *Strategy* recognizes a need for applicable tools and methods, and the Army plans to "develop the necessary objectives, initiatives, monitoring and assessment tools and procedural changes to assure progress" toward the aggressive goals set in the *Strategy* (p. 7). Furthermore; "Where tools and management initiatives exist, they will be applied; where they do not, [the Army] will develop them" (p. 7).

The research reported in this document focused on the challenging task of translating sustainability policy goals into concrete action. This research specifically examined three tools that are currently required for planning and decision-making at Army installations: Comprehensive Planning (Real Property Master Planning Process), Environmental Impact Assessment (compliance with the National Environmental Policy Act) and Environmental Management Systems. These procedural tools have been associated with implementation of sustainable development in a variety of contexts, and as such, the Army is in a unique position to innovate. The research utilized literature from multiple sources, including Army documents and academic journals, in an analysis of the strengths and weaknesses of each of these procedures for their applicability in support of sustainable installation policy goals. The review found that the three procedures compliment each other – weaknesses in one can be compensated with strengths of another. Current Army implementation of these procedures is along parallel yet separate paths, and increased efficiency and effectiveness are possible with enhanced integration. A single process that complies with all requirements is proposed in this document.

The challenges for Army integration of these procedures in support of sustainability are two-fold: 1) the procedures must be implemented as intended by the underlying process models and currently there are multiple implementation problems, and 2) the organizational barriers to integrated planning and management must be identified and overcome. The recommendations presented in this document focus on these challenges, encouraging a detailed examination of current implementation issues, an increased focus on long-range planning, an integration of NEPA compliance at the planning level rather than the project level, and the use of existing NEPA documentation during the EMS planning and implementation.

PREFACE

Elizabeth Keysar, Research Fellow and Oak Ridge Institute for Science and Education (ORISE) participant at the Army Environmental Policy Institute (AEPI), prepared this report for AEPI. The views expressed in this paper are those of the author and do not necessarily reflect the official policy or position of the U.S. government, the Department of Defense, or any of its agencies.

The mission of the Army Environmental Policy Institute (AEPI) is to assist the Army Secretariat in forward-looking policies and strategies to address environmental issues that may have significant future impacts on the Army. In executing this mission, AEPI is further tasked with identifying and assessing the potential impacts on the Army of emerging environmental issues and trends.

This report examines implementation challenges at the installation level for the new *Strategy for the Environment*, which focuses on mission support based on the principles of sustainability. The focus on sustainability requires a new perspective for installation management, and integration of existing decision support tools will enhance the ability of these tools to support new policy goals.

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ACRONYMS

ASA (I&E)	Assistant Secretary of the Army (Installations and Environment)
AR	Army Regulation
CERL	Construction Engineering Research Laboratory
CEQ	Council on Environmental Quality
CP	Comprehensive Planning
DOD	Department of Defense
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
FORSCOM	U.S. Army Forces Command
IAIA	International Association for Impact Assessment
IMA	Installation Management Agency
ISO	International Organization for Standardization
ISP	Installation Sustainability Program
NEPA	National Environmental Policy Act
USACE	United States Army Corps of Engineers

1 INTRODUCTION

The new *Army Strategy for the Environment*, (ASA (I&E), 2004), currently in the coordination draft stage, sets a new tone for the Army Environmental Program. The Army will "transition from a compliance-based environmental program to a mission-oriented approach based on the principles of sustainability" (p. 1). Although principles and concepts of sustainability and sustainable development are becoming increasingly clear and accepted both in the Army and throughout policy circles, the methods and tools designed to enable movement toward sustainable communities, regions or installations are not (Beatley & Manning, 1997; Berke and Conroy, 2000; Owens and Cowell, 2002; Rydin, 1998; Selman, 1996). The Army *Strategy* recognizes a need for applicable tools and methods, and the Army plans to "develop the necessary objectives, initiatives, monitoring and assessment tools and procedural changes to assure progress" toward the aggressive goals set in the *Strategy* (p. 7). Furthermore; "Where tools and management initiatives exist, they will be applied; where they do not, [the Army] will develop them" (p. 7).

The focus of the Army *Strategy* is significant at the installation level, where much activity has already been initiated in pursuit of sustainable operations (Eady, 2003; Jones, et al., 2002; Phillips, 2004). In the area of land use management, many sources in planning literature examine the applicability of land use planning to achieve sustainability objectives (Berke, 2002; Campbell, 1996; Jepson, 2001). Elsewhere, new tools have been proposed, and established methods are being re-examined (Brugmann, 1996; Gardner, 1989; Robèrt et al, 2002). Several integrated models have been proposed (Armitage, 1995; Ravetz, 2000; Rotmans et al., 2000). A recurring theme in the literature is that conclusions about the applicability and effectiveness of various tools and models are theoretical; it is too early to tell if any of the methods are working, and implementation issues abound (Lawrence, 1997; Thomas & Furuseth, 1997; Wheeler, 2000). What is clear is that some *modification or combination* of traditional tools will be necessary to achieve policy goals related to sustainable development.

This paper examines the applicability of three existing procedural tools related to installation land use planning and management in order to understand how they may be applied to achieving sustainability policy goals. These tools are *already required* by Army policy, thus it is advantageous to maximize their utility in the achieving the ambitious goals set by the *Strategy for the Environment*. The tools examined are: Comprehensive Planning (CP), Environmental Impact Assessment (EIA), and Environmental Management Systems (EMS). These procedural tools have been associated with implementation of sustainable development in a variety of contexts. This paper draws from multiple literature sources, including Army documents and academic journals, in an analysis of the strengths and weaknesses of each process. The literature reviewed promotes an integration of the procedural tools in order to overcome weaknesses and maximize on strengths. These observations lead to a discussion of how the Army may enhance implementation of sustainable operations policy goals through procedural integration.

The challenges for Army integration of these procedures in support of sustainability are two-fold; 1) the procedures must be implemented as intended by the underlying process models and currently there are multiple implementation problems, and 2) the organizational barriers to integrated planning and management must be identified and overcome. This paper focuses on the theoretical connections under the assumption that Army practice is ideal. As this paper will demonstrate, these tools are useful in support of sustainability, and renewed emphasis on improved implementation throughout the Army will aid in implementation of the *Strategy for the Environment*. This paper will briefly address organizational barriers and implementation problems, as full examination of these issues is beyond the scope of a single paper[1].

This paper presents the results of this research in the following manner. First, a general review of the origin and intent of each tool is presented to demonstrate how the Army is unique in its application of all three. This section is followed by a detailed review of Army policy and implementation requirements and the current relationship of the tools. The third section examines the strengths and weaknesses of each tool for implementing sustainability, based on a review of sustainability principles. The fourth section reviews the theoretical connections between the tools, and how procedural integration can compensate for identified weaknesses. The fifth section reviews the implications for Army practice, including an attempt to chart an integrated process. The final section presents conclusions and recommendations.

2 BACKGROUND

2.1 Procedural Origins

CP, EIA and EMS originated in different disciplines, and the underlying purposes for each process are different. The terminology associated with the procedures varies greatly, even though the underlying concepts are often the same. Table 1 presents a brief, generic comparison of origin, purpose, underlying discipline and implementing unit for each process. It can be seen in Table 1 that there is little overlap in the fundamental premise for each of these procedures, yet each has been associated with sustainability efforts. The table also helps to explain why it is rare to find all three conducted by a single organization in that few organizations operate as government entities and as private businesses simultaneously. The application of these tools has not expanded significantly beyond the particular organizational context in which they were originally developed and applied, except in cases such as the Army installation.

The unique characteristics of land use and environmental management at Army installations can provide valuable insight to sustainability planning and implementation for other federal agencies, as well as municipalities. Part of this uniqueness relates to the management of resources at Army installations. First, installation land and

[1] Issues relating to implementation of Master Planning and EIA are reviewed in Keysar & Steinemann, 2002.

infrastructure resources are managed much like a city or town, thus CP in the form of Master Planning. Second, the management of natural and cultural resources must comply with federal regulations and mandates, thus compliance with the National Environmental Policy Act (NEPA) and use of EIA. Finally, the Army as an organization follows principles of fiscal and strategic management espoused by corporate America, thus adoption of EMS according to the industry standard.

Table 1: Generalized Overview of CP, EIA and EMS

	Environmental Impact Assessment	Environmental Management Systems	Comprehensive Planning
Origin	Government regulation in response to concerns about the state of the natural environmental; National Environmental Policy Act (1969) NEPA	Private-sector concern for environmental quality; International Organization for Standardization (ISO) is one source of standard procedures	Planning profession origin in unsatisfactory conditions of modern cities in early 1900s, detailed academic theory of 'comprehensive plan' in 1950s; links environmental conditions to land use, infrastructure and economic development
Purpose	To place environmental considerations on par with technical and economic considerations in government decision making	To enable business managers to track environmental impacts caused by organization and reduce these impacts	To set goals for community-based physical development and justify land use, capital investment and programmatic decisions for the community
Discipline	Natural Sciences, Environmental Science, Ecologists, Lawyers, Social Scientists	Managers, Engineers	City Planners, Politicians, Local Neighborhood Officials
Unit of Implementation (Typical)	Federal Government Agencies, State-Level Agencies	Business Organizations	Local Municipalities

2.2 Army Context

Army environmental management is driven by a command and control system with a "series of uncoordinated programs that focus on media and have different standards, administrative requirements, and implementation procedures" (Lachman, Camm & Resetar, 2001, p.9). The inefficiencies of such an approach are increasingly being recognized, and more integrated approaches to facility management are being examined (Lachman, Camm & Resetar, 2001). A media-focused system presents a fragmented picture of the impacts an installation's operations have, and overcoming this challenge is essential to achieving sustainability policy goals. The procedures examined in this paper represent a portion of the many programs implemented by Army installations, and the many disciplines responsible for managing each program.

This section will review the Army implementation policies through a diagrammatic representation: Figure 1. This Procedural Flow Chart depicts the basic steps of each procedure – Master Planning, EIA and EMS – vertically arranged according to the basic, underlying activities; Define, Analyze, Develop Solutions, Implement and Monitor and Adapt. Current Army policy recognizes, to a certain extent, the parallel paths of these three procedures, but active integration is not a reality. The Procedural Flow Chart diagrams how these requirements are most often met – three separate processes conducted independently.

As planners for a land management agency, Army installation master planners must comply with Army Regulation (AR) 210-20, *Master Planning for Army Installations* (US Army, 1993). This regulation is based on the concepts and principles of comprehensive planning. The Real Property Master Plan sets strategy to meet the facility needs of the many installation functions, including live-fire training, mobilization exercises, weapons training and testing (to name a few mission-related activities) as well as house, educate and support the soldiers and their families. As shown in Figure 1, the master planning process includes 1) identifying the mission requirements of assigned troop units, tenant activities, and community organizations, 2) applying criteria to determine real property allowances, 3) identifying assets, deficiencies and excesses, 4) defining and evaluating alternatives to satisfy deficiencies, 5) considering developmental constraints, 6) identifying the preferred solutions, and 7) developing the programming actions for prioritization and approval (US Army, 1993, Chapter 2-4[b]). The planning process outlined by AR 210-20 stresses the importance of coordination and joint decision-making by "involv(ing) the customer throughout the entire process" (US Army, 1993, p.3).

Facility planners at Army installations are typically located in the planning branch of the Public Works Directorate. Planners spend most of their time managing the construction process at their installation. When a new project is nearing the construction stage, planners will notify the environmental branch, or the "NEPA People" within the branch to review the environmental constraints and begin the NEPA paperwork. Thus, Figure 1 depicts a "Project-Level EIA" within the "Implement" column, as this is the most common interaction point between Master Planning and EIA – at the implementation stage of the Master Planning process (refer to Keysar & Steinemann, 2002).

The Army Master Planning process is linear with little provisions for feedback or modification. Although planning is considered to be 'iterative', guidance does not specify techniques for re-assessing the original plan, or making adjustments. Furthermore, environmental documentation is viewed as an add-on analysis, and is not integral to the process. The regulations state: "the master planner analyzes and integrates operational and developmental plans of engineering functional areas, other installation staff elements, assigned units, tenant activities, higher headquarters, and surrounding communities" (US Army, 1993, p.3), but does not specify mechanisms to enable this integration.

The Army, as a federal agency, is subject to the requirements of the National Environmental Policy Act (NEPA). As such, the Army has its own implementing regulations, AR 200-2, *Environmental Analysis of Army Actions* (DOD, 2002). AR 200-2 is written in the spirit of NEPA, outlining how environmental considerations will be included in Army decision-making. Compliance with the AR 200-2 means that an Environmental Assessments (EA) or an Environmental Impact Statements (EIS) must be prepared to analyze the environmental impacts of proposed plans and projects; the regulation specifies the responsibilities of the proponent, the timing of the phases, and the content of environmental documentation. At Army installations, there is typically a "NEPA Coordinator" that manages compliance with NEPA and AR 200-2. This individual is often located within the environmental branch of the Public Works Directorate.

Figure 1 depicts the major activities in EIA for an Army installation based on two levels of analysis – the Programmatic (or Planning) Level and the Project Level. As previously noted, the most common compliance point is at the project stage. The AR encourages planning level EIA: "The integration of NEPA into other overarching Army plans can also streamline the NEPA process, eliminating separate documents that address components of larger plans." (DOD, 2002, Preface). Implementing this recommendation has many issues (Keysar & Steinemann, 2002). The AR also specifies procedures for mitigation and monitoring (DOD, 2002, p. 15305, section 651.15), although in practice this is difficult to implement, as NEPA funds are tied to project funds and are not long-term.

In response to Executive Order 13148 "Greening the Government Through Leadership in Environmental Management," each Army installation has been directed to adopt an environmental management system that is ISO 14001 compliant.[2] Adoption of the ISO 14001 Standard (ISO, 1996) by an organization implies a commitment to overall and continuous process improvement in the management of the environmental aspects of the organizations' activities. The Standard details a process that involves setting of environmental policy, identifying and examining the environmental aspects and impacts, setting objectives and targets based on the identified impacts and established policies, and implementing procedures to train employees, monitor progress, and continuously adapt the EMS.

The Army EMS Implementers Guide (LMI, 2003) details a process that begins with a "mission focus" in order to center the EMS on the mission priorities of a given installation. Once this mission focus step is complete, the environmental policy is crafted and adopted. The process then follows that of the ISO 14001 Standard, and is depicted in Figure 1. The Implementers Guide describes how the EMS Management Representative must lead an effort to carefully inventory and document all of the

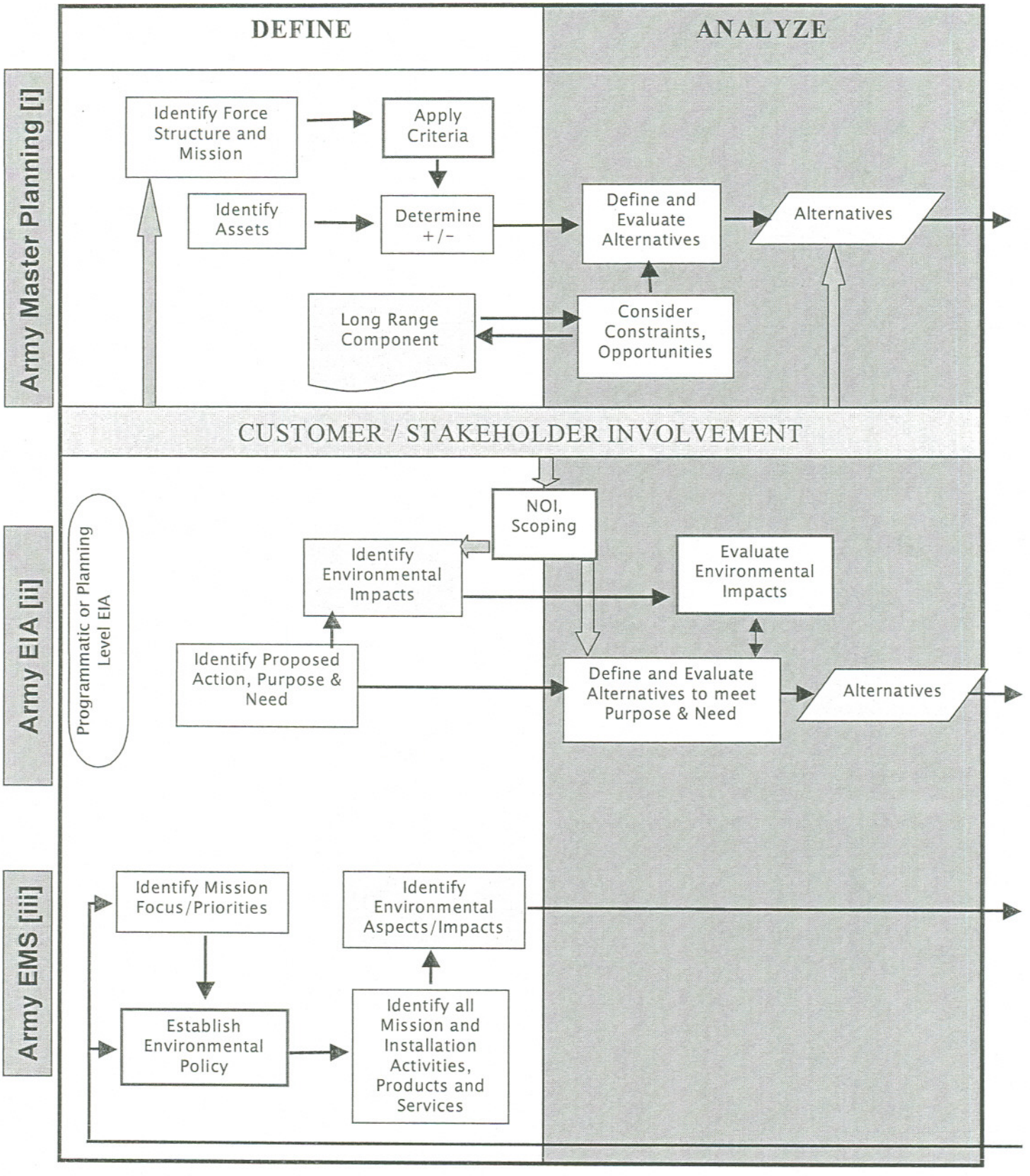
[2] Initial implementation is expected by 2004 and an EMS must be in place by December 31, 2005. Full conformance with the ISO 14001 standard shall be completed by 2009 as stated in an Action Memorandum dated July 31, 2001, from Raymond Fatz, Deputy Assistant Secretary of the Army (Environmental Safety and Occupational Health) for the Assistant Chief of Staff for Installation Management.

significant impacts associated with the operation of their installation. Goals and objectives are set in support of the environmental policy and then monitoring and measurement procedures are developed to track progress toward reaching these goals. Unlike CP and EIA, the EMS focuses specific procedures on training and awareness, tracking success, adapting policies, and making changes. The EMS provides a systematic measurement tool to track progress towards goals, and in the process, much of the same information needed for CP and EIA is collected and reviewed. EMS implementation is supervised by an EMS "Management Representative" that is designated by the Garrison Commander. This individual is typically located within the environmental branch, pollution prevention office of the Directorate of Public Works.

Figure 1 shows the potential for improved *efficiency* by integrating the procedural requirements, that is, by not repeating the same step several times. For instance, all three procedures begin with an identification of the installation's mission. In Master Planning this step is called: "Identify Force Structure and Mission", in EIA (at the programmatic level) this is "Identify Purpose and Need", and in EMS implementation this step is called "Identify Mission Focus and Priorities." Another example can be found in the implementation portion of the flow chart. Here, the Master Planning process has identified a list of projects and the expected time frame for completion in the "Short Range Component" of the RPMP. This same list of projects and actions are the "alternatives" to be evaluated in the project level EIA, and these are also the day-to-day operational level actions to be monitored by the EMS. Earlier evaluation of environmental impacts at the planning level (both master planning and EMS planning) will lessen the environmental analysis needed at the project level because significant impacts of most activities have already been identified.

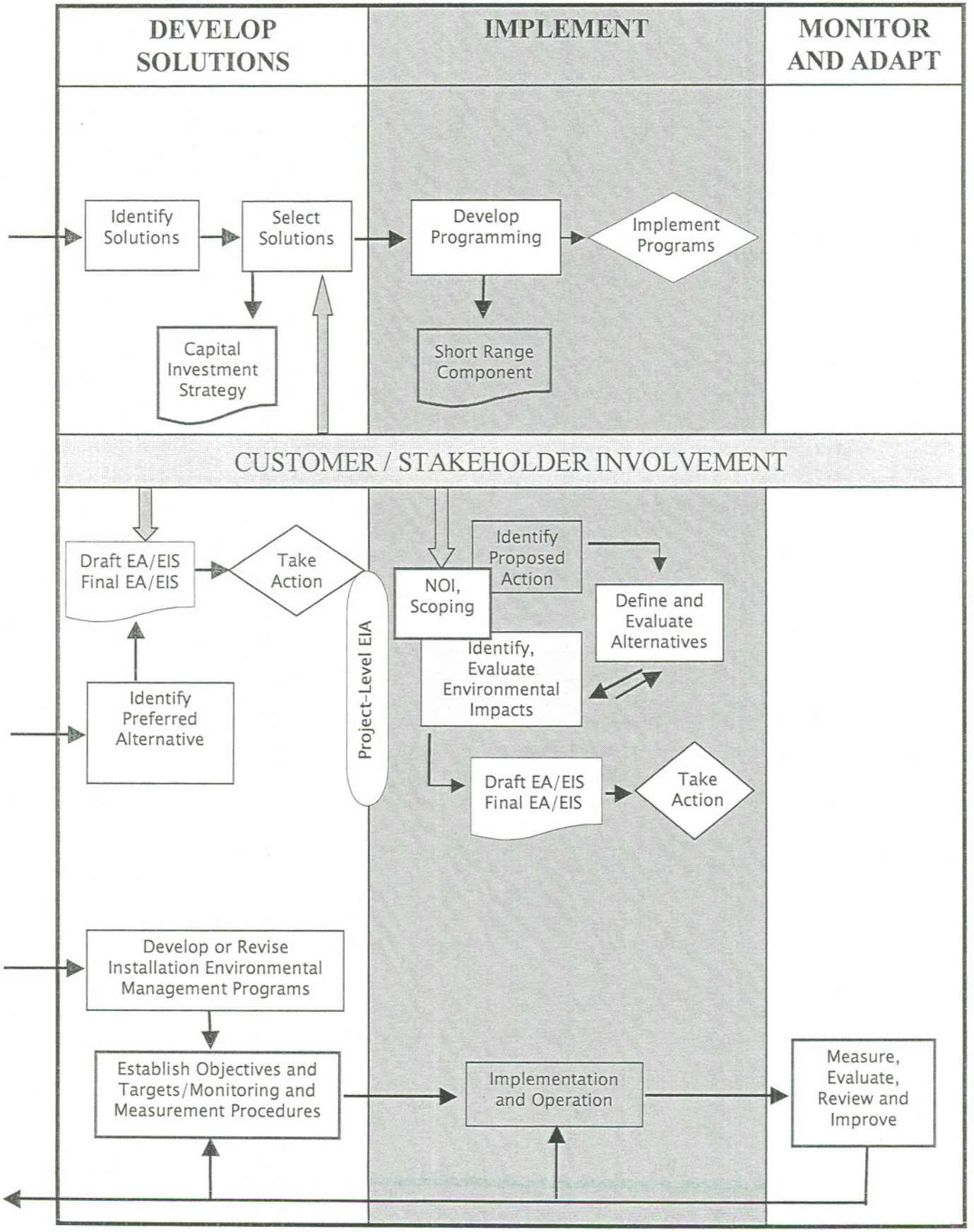
Potential improvements in efficiency are apparent from examining the procedural requirements. The next question relates to the impact integrating procedures will have on *effectiveness*, that is, will procedural integration improve outcomes, especially in support of sustainability? The next section of this paper addresses this question.

Figure 1: Procedural Flow Chart



[i] The steps for Master Planning are based on a diagram located on page 28 in EDAW, 1999.
[ii] The steps for Environmental Impact Assessment are based on AR 200-2 (DOD 2002).
[iii] The Steps for Environmental Management System are based on the Army Implementer's Guide (LMI, 2003)

Figure 1: Procedural Flow Chart



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3 APPLICABILITY TO SUSTAINABILITY

3.1 Sustainability Principles

The concepts of 'sustainable development' and 'sustainability' have been characterized as being too general, too complex, and too ambiguous (Owens & Cowell, 2002; Pezzoli, 1997; Selman, 1996). Most definitions are also imprecise and descriptive rather than prescriptive (Jepson, 2001). The many definitions found in the literature tend to reflect the language and priorities of the discipline proposing the definition, and "different interests groups have different interpretations" (McDonald, 1996, p. 225). Sustainable development is one of the *processes* needed to achieve sustainability, or a sustainable society (Robèrt, et al., 2002). The concept of 'sustainability' thus defines the end state or goal. In this paper these terms are used interchangeably. Interpreting the definitions into strategies for action is where the problems and challenges emerge - precisely because the definitions are vague and descriptive, and because of the tremendous scope and complexity of the problems sustainability embraces.

The definitions and principles for sustainability have common threads. These revolve around finding a balance between the (often conflicting) goals of economic prosperity, ecological integrity and social equity, commonly referred to as the 'Three E's' or the 'Triple Bottom Line' (economy, environment and equity). This balance requires a comprehensive and holistic view of natural and manmade systems and an understanding that achieving goals in one area in isolation of the others has resulted in environmental damage and social inequities that threaten our future, and the ability of future generations to prosper (or an Army installation to continue to meet mission requirements). Guiding principles of sustainability can therefore be expressed as: inter- and intra-generational equity; protecting and living within the carrying capacity of the natural environment; maintenance of biodiversity; consideration of waste assimilation capacity; minimization of natural resource use; and satisfaction of basic human needs (Krizek & Power, 1996; McDonald, 1996).

The challenge of sustainable development has been to translate these basic principles into action. In addressing the application of tools, Robèrt and others (2002) stress the need to establish a set of higher order principles first, based on scientific laws of thermodynamics. Each locality, government or organization then must devise strategies and employ tools most applicable to its particular context (Robèrt, et al, 2002).

Procedural characteristics of tools for implementing sustainable development have been defined as: goal seeking; relational or systems-orientated; adaptive; self-reflective; dynamic; responsive; evolutionary; iterative; interactive; and participatory (Gardner, 1989; McDonald, 1996). In evaluating the decision-making procedures of CP, EIA and EMS, it is useful to compare the requirements of these tools to these characteristics, but it is also important to keep in mind the substantive outcomes that are implied by the higher-order objectives of a healthy planet where all basic human needs are met. As McDonald (1996) points out, "it is impossible to divorce process issues from substantive issues – to separate the means from the ends" (p. 230).

The Army has been formulating definitions of sustainable development, and has yet to adopt a single definition. "A key issue for the Department of Defense (DoD) and the individual services is the practical application of sustainability within the unique culture of the military" (EDAW, 1999). In 1992, the Army Chief of Engineers viewed sustainable development as a mind-set that "drives the development of appropriate technology, materials and processes" to support development that "doesn't adversely affect our natural resources" (Todd, 1992). The Installation Sustainability Program (ISP) represents the efforts of Army Forces Command (FORSCOM), and now the Installation Management Agency (IMA), to address major environmental issues in a proactive manner.[3] The definition of a 'Sustainable Installation' developed through the ISP is an installation that:[4]

- Optimizes military training
- Provides for the well-being of soldiers and families
- Has a mutually-beneficial relationship with the local community
- Is life-cycle cost-effective to operate
- Systematically decreases its dependence on fossil fuels and mining, and non-biodegradable and toxic compounds
- Does not use resources faster than nature can regenerate them,
- Operates within its "fair share" of earth's resources

The *Army Strategy for the Environment* echoes the ISP definition: "a sustainable Army simultaneously meets mission requirements worldwide, safeguards human health, improves quality of life, and enhances the natural environment" (ASA (I&E), 2004, p. 1).

An assessment of current planning policy and practice was conducted to identify the challenges impeding DoD agencies from planning and developing facilities according to the principles of sustainability (EDAW, 1999). Of the many challenges identified, communication and coordination between disciplines and different levels of authority is particularly relevant to the issue of procedural integration examined by this paper. In fact, for military installations "the most telling breakdown in communication is often between the environmental and planning component areas and organizations" (p. 43).

3.2 Comprehensive Planning

In sorting through the ideas of how, where and by whom sustainable development will be implemented, land use planning and the planning profession often take center stage, most particularly at the local level. "At some fundamental level, there is an inescapable role for planning if decisions about land use are important in determining what is 'sustained'" (Owens & Cowell, 2002, p. 16). Thus land use planning, specifically

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[3] Memorandum for Commanders, FORSCOM Installations, dated July 9, 2001, from Lieutenant General Lawson Magruder, III, Deputy Commanding General/Chief of Staff, U.S. Army Forces Command, and Memorandum to Commanders of all Major Commands dated February 25, 2002, from General John Keane, Vice Chief of Staff, Headquarters, Department of the Army.

[4] Drawn from the Fort Carson Installation Sustainability Executive Conference Facilitator's and Recorder's Playbook, August, 2002.

comprehensive planning, "is one of the essential tools to achieve sustainable development" (McDonald, 1996, p. 230). The central concept of CP is the comprehensive plan, also called a master plan, development plan or general plan. This plan is intended to guide the physical development of a community based on a common vision for the future as established by the community members. The policy guidance established by the comprehensive plan is used to justify the capital improvement programs, zoning ordinances and subdivision regulations a community will adopt.

The principles and characteristics of CP are similar to those of sustainable development, and this is primary reason CP is a strong tool for achieving sustainability. The plan is about big ideas and main issues (Kent, 1964); it summarizes policies and programs, and provides general guidance and direction (Black, 1968). Master plans are comprehensive - planners recognize the city as "a system of interrelated social and economic variables extending over space" (Friedmann, 1965, p. 212). Master plans cover all the geography related to the particular jurisdiction and "all the subject matter related to the physical development of the community" (Kelly & Becker, 2000, p. 2). CP is a holistic process – a process that gathers together the necessary specialized expertise to report on baseline conditions and formulate feasible alternatives. The master plan is long range – it looks "beyond the foreground of pressing current issues to the perspective of problems and possibilities 20 to 30 years in the future" (Black, 1968, p. 349). CP is inclusive – necessarily involving the input of those who will be impacted by the plan in order to formulate goals and ensure acceptance. The plan serves as a tool to guide decision-making – it contains technical information that provides context for the judgments made by public officials. The plan provides an overall framework such that the reasoning behind capital investments is explicit.

The underlying logic of preparing comprehensive plans provides a clear demonstration of how this tool is applicable to implementing sustainability. "That logic is simply that it is wise to look ahead, to anticipate rather than react, to coordinate rather than compete, and to make decisions that are based on shared community objectives" (Hollander, et al., 1988, p. 90).

Planning literature promotes an active and leadership role for planners in the implementation of sustainable development for local communities since "many of the fundamental philosophies behind sustainability are also an integral part of what for years has been considered good planning" (Krizek & Power, 1996, p. 23). Planners are accustomed to analyzing options in relation to an uncertain future, and they do so in a strategic way (Blowers, 1993). Planners are familiar with interdisciplinary approaches, involving the public, and coordinating between multiple agencies. As a plus, planners have developed political savvy and are often "directly responsible for developing and administering the regulations and guidelines (or even incentives) to guide action" (Krizek & Power, 1996, p. 23). The planning profession is well suited to the task of turning abstract ideas into practical action, and has an "intrinsic interest in integration and balance" (Jepson, 2001, p. 507).

CP also has two major weaknesses for the implementation of sustainable development (Rydin, 1998). The first is that regulation is the primary implementation tool of planning. Regulations have a limited scope and flexibility; "the primary focus is on the physical environment rather than the activities that take place within that environment" (Rydin, 1998, p. 755). Regulations can only indirectly influence outcomes, and thus are insufficient to deliver necessary results. The second major issue is the "conservationist and preservationist tendencies of a planning system rooted in a negative rather than proactive set of powers and associated patterns of local politics" (Rydin, page 756). This preservationist characteristic is a common critique of plans and especially the planning regulatory tools of zoning and subdivision. Planning tends to provide a tool for protecting the status quo and avoiding risks. This tendency limits the ability of planning to promote the change and innovation necessary to move toward sustainability goals. This concern is substantiated by a case study of Davidson, North Carolina (Thomas & Furuseth, 1997). After studying Davidson's attempt to plan for sustainable development, the authors conclude that "instead of making hard decisions that ultimately change people's behavior and alter their interaction with the natural environment, the plan simply directs growth in a manner that is acceptable to the community" (p. 225).

3.3 Environmental Impact Assessment

Environmental Impact Assessment (EIA) has emerged as a powerful tool for including environmental considerations in the decision making process of federal agencies in the United States, and also State agencies where state-level EIA has been mandated. EIA is practiced in accordance with the National Environmental Policy Act (NEPA).[5] Signed into law January 1, 1970, this statute (and its subsequent implementing regulations adopted in 1978 and 1979) was the first to require EIA, and has since been copied by governments around the world (Wood, 1997). As Kaufman (1997) notes: "the fact that the [United States] has had a sustainable development policy for over 25 years, comprehensively articulated in the National Environmental Policy Act of 1969, seems to have largely been forgotten" (p. 314).[6] NEPA is the only federal statute that articulates such a vision, and it "explicitly includes nearly all the sustainability provisions called for by contemporary sustainable development proponents" (p. 314). Euston (1997) argues:

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[5] Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258 § 4(b), September 13, 1982

[6] Pub.L. 91-190, Title I, section 101(a) states: "The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and the new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

"NEPA is our most grounded statutory bridgework into the real future of critical resource choices" (p. 327).

There are many strengths of the EIA process for supporting sustainable development. NEPA provides a rational model for evaluating government actions (Clark, 1997), and has brought the perspectives of environmental professionals into the decision-making process, serving an important educative role (McDonald & Brown, 1995). Ideally, NEPA (and EIA) allows the public to become informed of, and involved in, the decision making process (Gardner, 1989; Kaufman, 1997; Wells, 1997). Thus, EIA is supportive of sustainability by "making us aware of the environmental consequences of our actions and institutionalizing a public forum for the making of tradeoffs" (Gardner, 1989, p. 358).

EIA is a familiar and established set of methodologies specifically focused on environmental impacts of development actions. NEPA implementation has created a profession of experts at identifying, quantifying, measuring, evaluating, mitigating and monitoring impacts. The critical framework established by impact assessment processes represents a set of skills that are necessary for managing the complex issues associated with sustainable development. "These include coping with uncertainty and risk, dealing with conflicts of interest and preference, coordinating scientific analysis and public inputs, and weighing facts and values in organizing information for decision-making" (Sadler & Jacobs, 1990, p. 17).

The major weakness of EIA is that it is practiced in a reactive fashion, responding to proposals late in the planning and decision making process. Thus, the narrow focus of this tool is seen as inadequate for advancing general (and proactive) policy objectives, such as sustainability (Arce & Gullón, 2000; Shepherd & Ortolano, 1996). EIA is seen as negative and critical; "It does not generate solutions, it sets limitations or requirements on what can be done" (Holtz, 1990, p. 103). EIA starts too late, ends too soon, and tends to evaluate a narrow range of issues – issues related just to the impacts of the project, not the original objectives (McNeely, 1990). Proponents call for an "evolution" or "re-creation" of current practice such that EIA is applied earlier and more proactively (Clark, 1997; Dennis, 1997; Euston, 1997; McDonald & Brown, 1995; Rees, 1988).

Given its project level implementation and its focus on the 'natural environment', EIA is weak at addressing the other components of sustainability - social equity and economic prosperity (CEQ, 2003). Guidance for addressing these issues is minimal (CEQ, 2003), although the issue of environmental justice has been addressed (CEQ, 1997a; EO 12898, 1994; Wilkinson, 1998). The solution advocated by the International Association for Impact Assessment (IAIA) implies that other types of impact assessment exist that will continue to build on the existing frameworks (IAIA, 2002). "Because of its widespread use, EIA offers a practical basis for leveraging an integrated, participatory approach that can help achieve the three goals of sustainable development" (p. 3). IAIA stresses the need for strategic environmental assessment (SEA)[7] to be developed as a

[7] Strategic Environmental Assessment (SEA) is environmental assessment that considers the environmental impacts of policies, plans and programs and their alternatives (Therivel, et al., 1992).

regulatory requirement as EIA (often) is now. IAIA also defines a wide array of tools as fitting in the umbrella term "impact assessment," of which EIA is only one.[8]

3.4 Environmental Management Systems

The need for Environmental Management Systems (EMS) has been recognized by the international business and industrial communities to reflect the expanding role environmental issues are having on the bottom line. "Organizations of all kinds are increasingly concerned to achieve and demonstrate sound environmental performance by controlling the impact of their activities, products or services on the environment" (ISO, 1996, p. v. Introduction). The International Organization for Standardization (ISO) developed a management standard (ISO, 1996) to outline a process by which a company can design and implement a management system focused on environmental issues. "The overall aim of this International Standard is to support environmental protection and prevention of pollution in balance with socioeconomic needs" (page vi, Introduction).

The strength of this management tool is that it "provides a comprehensive and logical administrative vehicle" (MacDonald, 2003, p. 2). EMS provides a concrete link between planning and implementation. It follows the classic management cycle of 'plan-do-check-act.' Monitoring, reporting, training, feedback and self-correction procedures are established by the EMS. EMS is conducted as a continuing process, and can therefore be useful in addressing environmental impacts over the life cycle of a project or product (Eccleston & Smythe, 2002).

The major weakness of EMS is that it is only as effective as the organization makes it – the management system itself is neutral. In order to reach environmental policy goals, implementation of an EMS requires a management commitment to those environmental objectives; "adoption of this International Standard will not in itself guarantee optimal environmental outcomes" (ISO, 1996, p. vi. Introduction). The EMS focuses on downstream effects of the organizations' actions, not the underlying principles; "consequently, that work often relies on vague guiding principles of 'continual improvement' without the determination of ultimate objectives that comply with basic principles for sustainability" (MacDonald, 2003, p. 2). An additional weakness of EMS is that the stakeholders are often internal - there is no requirement for public involvement (only public notification of company initiatives), and "the company's own management can usually be persuaded by less rigorous arguments than would be required to convince external parties" (Sanchez & Hacking, 2002, p. 26).

[8] "Impact assessment is an umbrella term which encompasses a family of tools, including sustainability assessment, project evaluation, technology assessment, health impact assessment, ecological and biodiversity impact assessment, environmental management systems, public consultation/public assessment, environmental impact assessment, demographic impact assessment, climate impact assessment, cultural impact assessment, gender impact assessment, social impact assessment, environmental auditing, risk assessment, strategic environmental assessment, trade policy assessment, and natural disaster planning" (IAIA, 2002, p. 3).

4 INTEGRATION OF PLANNING AND DECISION MAKING PROCEDURES

The analysis presented thus far demonstrates that each of the decision-making and management tools examined has both strengths and weaknesses for pursuing policy goals related to sustainability. This section will explore the literature relating to the integration of these procedures. A recurring theme is that efficiency and effectiveness can be enhanced through integration of these tools.

4.1 EIA and Comprehensive Planning

The call for implementing EIA higher in the decision-making tree is one that is frequently repeated in the evaluation research; merging EIA with planning is a common theme to overcome the deficiencies of EIA (Armour, 1989; Clark & Canter, 1997; CEQ, 1997b; McDonald & Brown, 1995; Ortolano & Shepherd, 1995). Early observers commented on the importance of the point at which EIA is conducted. "The effectiveness of EIA, as a strategy for environmental protection, ultimately depends on its point of intersection with the planning and decision making process" (Armour, 1989, p. 5).

A positive relationship of EIA and CP was found in a review of state level EIA mandates (Pendall, 1998). An important lesson can be learned from states that require local environmental assessment (EA): that "good comprehensive planning requires EA and good EA requires comprehensive planning" (Pendall, 1998, p. 17). Localities without comprehensive plans that conduct EA on projects lack an understanding of the context in which the decisions are being made, thus the EA suffers. Conversely, comprehensive plans lacking EA disregard many possible alternative courses of action. EA on comprehensive plans "provides a systematic means to identify a plan alternative with superior air and water quality, open-space and habitat protection, and environmental quality" (Pendall, 1998, p. 17). Impact statements are decision-making tools that promote "better information gathering and more open government" and thus the "impact statement process complements the land planning process" (Pearlman, 1998, p. 42).

Examples of EIA and land-use planning integration in practice are uncommon, but those that exist provide a useful context for the advantages of concurrently implementing these procedures. Amir, et al. (1997) examines the influence of EIA on a regional planning effort in Galilee. The decision makers "joined" environmental protection and land-use planning into one effort by conducting EIA on the development plan "as an integral part of the plan making" (p. 60). Environmental protection was enhanced by the integration; decisions made at the conceptual planning stage allowed for the selection of a spatial solution that "helped reduce most potential environmental impacts of proposed development" (p. 68). EIA and land-use planning must be "seen as one effort that is integrated from the start and in each stage of the planning process" (p.59) in order to be more effective than EIA initiated at the plan approval stage.

The idea that EIA and master planning should be integrated at Army installations is not new. A technical report prepared in 1991 by the U.S. Army Corps of Engineers (USACE) Construction Engineering Research Laboratory (CERL) (Tyler, et al, 1991) specifically encourages integration of the environmental planning and master planning processes because of the potential to improve efficiency and effectiveness. FORSCOM requested this report as a follow-on to previous research (also sponsored by FORSCOM) regarding master planning at Army installations (Wheeler, et al, 1988). The need for strong land use planning and associated environmental analysis was recognized and advocated over a decade ago.

The CERL report advocates an integrated and tiered approach (comprehensive master plan with programmatic EIA) to save time and labor costs through streamlining and the ability to reference program-level documents. Project proponents can then "concentrate solely on those planning and assessment aspects that are specific to the project or action at hand" (p. 66). There is less risk of environmental "show-stoppers" or other planning disasters. Data and information collection can improve, be more dependable, and more accurate. The master plans would be "more environmentally sensitive and more responsive to overall Army and tenant needs" (p. 67). An integrated process will improve interdisciplinary coordination and help planners to respond to "short-fuse" needs. A recent review of Army practice (Keysar & Steinemann, 2002) confirmed that many of these predicted benefits are indeed being realized in practice.

4.2 EIA and EMS

EMS and EIA are not redundant processes; they are complimentary (Eccleston & Smythe, 2002). The interrelationships between EIA and EMS "are not well-understood by practitioners, proponents and governments" (Ridgeway, 1999, p. 394), so the benefits from integrated procedures are not realized. Effective transition to the operational phase is inhibited by the general terms in which mitigation measures are presented, and the by the perception by operational staff that EIA is "merely a bureaucratic requirement" rather than a "thorough investigation" (Sanchez & Hacking, 2002, p. 27). It is possible to more effectively link planning and operations by first overcoming terminology differences (actions v. aspects v. impacts) and then by restructuring the EIS to focus on "causal mechanisms." An integrated procedure utilizing the strengths of each process will overcome the weaknesses in the other.

Authors promoting the integration of EIA and EMS advocate EIA as an appropriate starting point for the EMS; integration of these tools will bring environmental concerns to all stages of the 'project cycle'. The EMS allows the management or mitigation measures required by the EIS to be converted into "enforceable commitments" (Sanchez & Hacking, 2002, p. 27). The EIA process identifies environmental impacts of proposed actions, so it is logical not to repeat this process for the EMS, but to transition the same information from one process to the other. Compliance with NEPA is a procedural requirement without a mandate to choose the most "environmentally beneficial alternative." Adoption of an EMS implies a commitment to "improving environmental quality" that can enhance the strictly procedural limitations of NEPA

(Eccleston & Smythe, 2002). The ISO 14000 standards do not have a public participation requirement, while this is a key component of EIA implementation.

4.3 EMS and Comprehensive Planning

Examining the potential integration of CP with EMS is not an easy task. Comprehensive planning is holistic and broad in its scope and application. CP, by its very definition, does not address specific projects and implementation details. EMS, on the other hand, is entirely focused on these types of details – converting policy into day-to-day operational targets and objectives. This extreme contrast in focus explains, in part, why there is little connection between these processes to be found in the literature. Another explanation lies in the implementing units. CP is implemented as a public decision-making tool by local governments, while EMS is implemented by private industry. Environmental sustainability has the potential to bring these procedures together, and examples in the literature demonstrate how – through the operational functions of local municipalities.

Local governments and municipalities have already been applying EMS to their operations. The United States Environmental Protection Agency (EPA) has been promoting the use of EMS by local government entities since 1997 (Davies, 1998; GETF, 2000; GETF, 2002). Pilot projects sponsored by the EPA have demonstrated multiple beneficial outcomes associated with implementing EMS for a 'fenceline' – a department, division, or operation within a larger governmental entity such as a city, county, or transit authority. This limited focus reflects the operational and pollution prevention focus of EMSs; the pilot projects are typically wastewater treatment facilities, departments of public works, electric generating facilities and solid waste management facilities.

A few examples of EMS implementation for municipal government activities at the administrative level were found. Efforts to use EMS in the overall management of a municipality are reported for a case in Canada (Bekkering & McCallum, 1999) and Sweden (Burström, 2000). The case of Hamilton-Wentworth, Canada, examines how an ISO 14001 compliant management system may help this municipality toward achieving goals set by its "Vision 2020 Sustainable Community Initiative." As Bekkering & McCallum point out: "a defined management system can be used by municipal government to help set priorities for addressing the concerns of its community, plus ensure its services are being delivered following efficient and effective practices" (p. 104). This case study explores the application of EMS to "all types of decision making" not just the "delivery of hard services, such as solid waste management or water treatment" (p.104). The Regional Environmental Department found the EMS was a useful tool for translating objectives and targets to the 'elected Council' as part of the annual budgeting process, leaving elected officials with the final decision-making authority. The authors report that the "EMS is the method of translating the vision statement into action and change" (p. 110).

Research on the efforts of a Swedish community to implement EMS found this management tool enabled communication and cooperation between the various departments in the municipality (Burstöm, 2000). Although the EMS implementation is in the early stages for this community, the researchers found "a change towards more open attitudes among municipal professions towards other municipal professions" (p. 282). Concurrent EMS implementation was required for all municipal organizations as a direct result of the high importance environmental issues are given in the community's politics, with explicit municipal executive board support and engagement. The strength of EMS for municipal government operations is that it provides a "platform and common language for environment-related communication and work," bridging the gaps between different disciplines and professions. Successful implementation, however, requires "a fundamental shift in the values and ethics of the organization towards environmental excellence" (p. 282).

5 IMPLICATIONS FOR THE ARMY

The analysis presented in this paper indicates that comprehensive planning, environmental impact assessment and environmental management systems can be valuable tools for the implementation of sustainability at Army installations. The question is the extent to which the tools will aid the Army in achieving its environmental policy goals. Army policy and regulation mandates the use of these tools; the question is not 'if' they'll be used – but 'how.'

Strengths of master planning in support of sustainability are found in its holistic and comprehensive view of the installation, and its focus on land use. Master planning impacts all facility decisions, and thus is a central processing point. Furthermore, the master planning process is about setting long-range goals for the physical development of an installation. This is based on a well-developed sense of mission priorities and tenant activities. The master planning process is also the primary mechanism for coordination of land use in surrounding communities. Current Army practice does not fully utilize these strengths; master planners are most often construction managers, and focus on the cantonment area. Communication of long-range goals established by the Master Plan to other functional areas is not adequate, lessening the relevance and utility of the Master Plan.

Strengths of NEPA compliance in support of sustainability can be found in its structured analytical procedures for identifying and quantifying environmental impacts. EIA also mandates public involvement, and tools that enhance participation and interaction amongst stakeholders are extremely important for sustainability. EIA is a decision-support tool; it supplies valuable information about the impacts of land use decisions – when implemented concurrently with the master planning process. Unfortunately, NEPA compliance is largely focused at the project implementation stage, and is the purview of select professionals within the environmental office (or their support contractors) and the value of the data and analysis is not fully communicated and appreciated.

Army installations are still in the early implementation phases of EMS, but its value for support of sustainability lies in the establishment of concrete measures for tracking progress. The planning stages of EMS implementation follow many of the same steps that the master planning process with a corresponding NEPA document would follow, and should be strong at gathering input from individual users throughout the installation. The weakness of EMS lies in its environmental focus; acceptance and adoption of the management system must extend beyond the environmental branch and the Directorate of Public Works for it to be fully successful.

Current Army implementation of CP, EIA and EMS suffers from many issues, impacting the ability of these tools to support sustainability. Furthermore, implementation of these tools is through parallel and independent paths with no defined cross-connections. Figure 2 presents a proposed Procedural Flow Chart of these processes merged into a single process with multiple functions. Based primarily on the Master Planning process, some steps can be combined or enhanced to satisfy multiple requirements. There is a single "definition" phase, when mission priorities and vision are articulated; along with all the data regarding the major activities conducted at the installation and the needed support facilities. This data provides the basis of the Long Range Component of the Master Plan.

NEPA analysis initiated at the planning level can be used to identify the significant impacts of the current and proposed activities at the installation, expressed in *operational terms*, which can easily be transferred into the EMS. Early planning requirements for the EMS are to collect and tabulate many of the same impacts. When alternative courses of action are defined and evaluated (in the Analyze phase); environmental impacts are an integral part of the analysis, integrating NEPA and master planning, and culminating in a planning or programmatic level EIS for the Master Plan.

At the implementation stage, project level EIA is conducted, and should be considerably streamlined now that major impacts have already been identified and addressed. The EMS on projects is based on operational issues, and can track any mitigation measures required by the NEPA documents. EMS can also monitor other environmental issues related to facility development and management such as site selection, building orientation, water and energy use, transportation connectivity, etc. All of these issues ultimately relate back to the environmental policies established early in the EMS planning stages. These policies will be based on sustainability principles and mission support.

Multiple opportunities for combined stakeholder input and background data collection are possible, and are essential to achieving sustainability policy goals. Master planning and EMS require input from stakeholders internal to the installation, while NEPA provides a mechanism for structured interaction with the community outside. The NEPA requirements should only enhance the coordination already functioning via Master Planning and the Real Property Planning Board. Participatory and inclusive planning and management processes are essential to achieving sustainable installation operations.

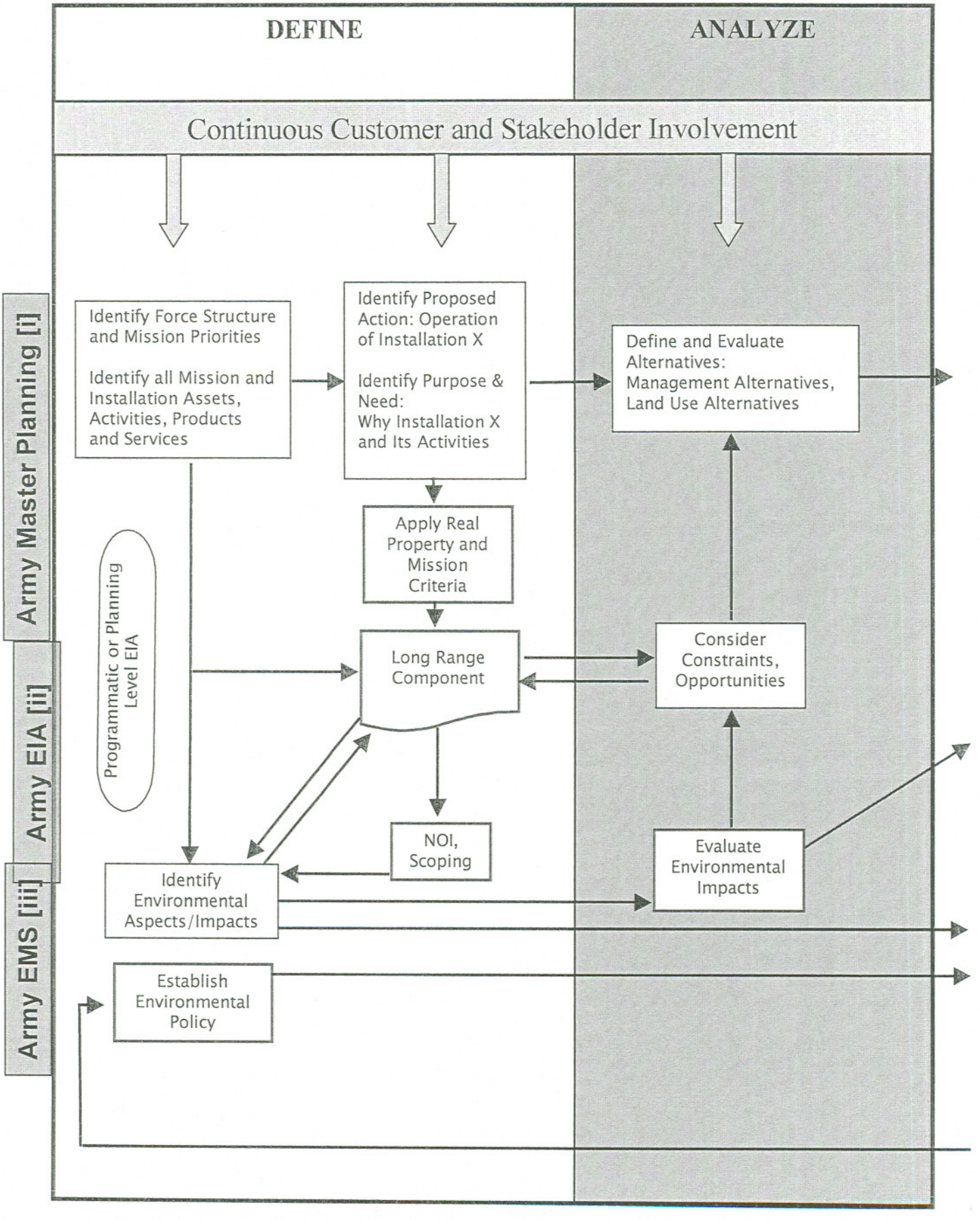
There are many ways the efficiency and effectiveness of land use at Army installations can be enhanced by conscientiously integrating CP, EIA and EMS – assuming that an effort is made to use each process as designed. Some of the ways efficiency and effectiveness may be enhanced include:

- Sharing of baseline data
- Documents that reference each other to avoid repetition
- In-house appreciation of documents and data available to them
- Increased interdepartmental information sharing
- Never 'starting from scratch'
- Common definitions of 'vision' and 'mission'
- Common perception of what issues are significant
- Enhancement of the connection among policy, planning and operations
- Concise, readable and actionable plans
- Establishment of indicators for tracking success

Ultimately, however, there is a need to establish meaningful overarching policy objectives - objectives that will influence both planning and operations throughout an Army installation. This represents the substantive component of implementing sustainable development, and sustainable outcomes for Army land management cannot be guaranteed just by following certain procedures. "Without environmental goals in plans, there is little likelihood that the environmental dimensions will be seriously considered in the preparation and administration of the plan" (McDonald & Brown, 1995, p. 488). Once common (and agreed upon) objectives are established, adequate and compatible background data is essential; "it is only with a complete inventory of Army environmental aspects that environmental priorities can be established and overall impacts eventually minimized" (Environmental Company, Inc., 1997, p.2).

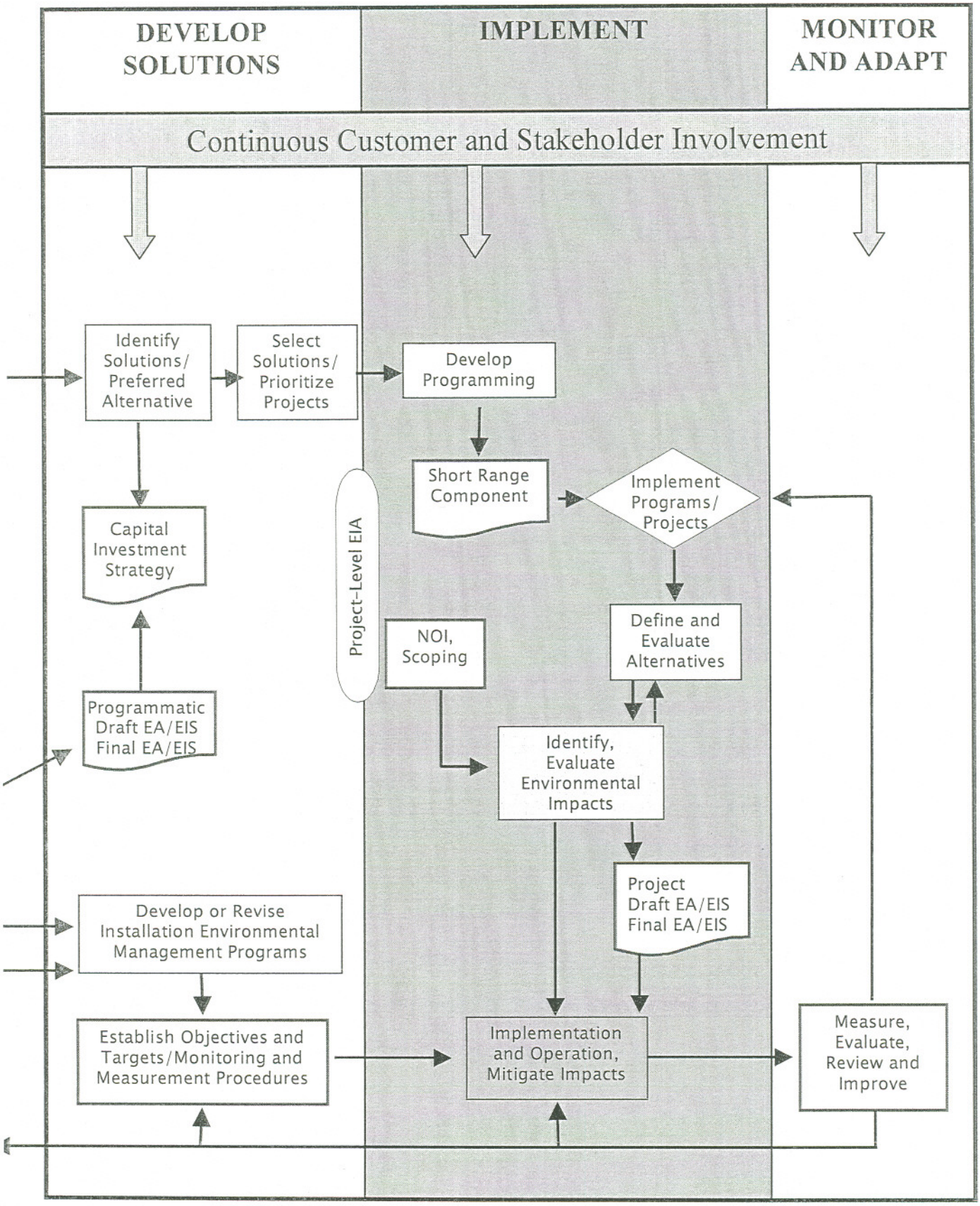
Army installation land managers, facility operators, tenants, and units must have a common sense of what the significant environmental issues are, how their actions contribute to these issues, and how these issues constrain their mission. It is important not to place expectations for any given procedure too high; any single process will not be enough. It is though a combination of tools and procedures that current unsustainable development practices and installation operations will be changed.

Figure 2: Procedural Flow Chart, Proposed



[i] The steps for Master Planning are based on a diagram located on page 28 in EDAW, 1999.
[ii] The steps for Environmental Impact Assessment are based on AR 200-2 (DOD 2002).
[iii] The Steps for Environmental Management System are based on the Army Implementer's Guide (LMI, 2003)

Figure 2: Procedural Flow Chart, Proposed



6 CONCLUSIONS AND RECOMMENDATIONS

Government agencies, local communities and private business face many challenges as they translate environmental sustainability goals into concrete actions. The Army has embraced a proactive stance for managing environmental issues, and sustainability has become part of the policy goals for installation management. Policy makers, master planners and resource managers are trying to understand the implications these policies will have on installation land and resource management. The Army installation experience is unique in that CP, EIA and EMS are required procedures, and this uniqueness should be used as a basis for innovation in implementing sustainability. In order to begin to successfully apply these procedural tools toward sustainability objectives, the following recommendations are forwarded:

6.1 Identify, Analyze and Address Implementation Issues

This research was based largely on theoretical and academic documentation of CP, EIA and EMS in order to emphasize the capabilities that *already exist* at Army installations. This research did not examine implementation issues, as this is beyond the scope of this paper. Furthermore, most of the existing data regarding implementation of master planning, EIA and EMS at Army installations is anecdotal and incomplete. Understanding the gaps between what Army policy calls for and what installations have adapted to is the first step toward maximizing the utility of these tools. Each of these tools has the capability to aid in achieving sustainability, but each should be practiced in accordance with its underlying process model. A systematic and thorough review of practice is recommended. Results of this review will be important towards beginning the integration of procedures, and the incorporation of sustainability objectives into installation planning and management.

6.2 Emphasize and Implement Long-Range Planning

NETCALL #10 (Aadland, 2003) calls for a renewed emphasis on installation master planning: "All installations must develop, coordinate and produce real property master planning. A key mission of DPW, this constitutes the critical first step in a process that defines the long-term vision and end-state of an installation." In addition, AR 210-20, *Master Planning for Army Installations*, is being revised. The proposed regulation adds scope and depth to the master planning process; the proposed changes will aid in enhancing the influence of long range planning on management decisions. An increased focus on Strategic Planning is also found in NETCALL #10, and is reflected in the new Plans, Integration and Analysis Office (PAIO) that Headquarters (HQ) Installation Management Agency (IMA) is calling for at each garrison (NETCALL #33). These trends all reflect a new emphasis on long-range planning that is necessary for the success of the procedural integration proposed by this paper. Part of this renewed emphasis on long-range planning should involve promoting an active role for land use planning professionals and taking advantage of the unique skills of planners; planners both inside and outside the fenceline.

6.3 Conduct NEPA Analysis Concurrently with Master Plan

The value of concurrent and meaningful NEPA compliance at the planning stage has been documented. Innovative approaches to integrating NEPA with Master Planning should be documented and communicated to installation practitioners. Barriers to integration should be identified and addressed.

6.4 Utilize NEPA Analysis to Identify Significant Impacts for EMS

Current and former NEPA documents contain extensive detail on the environmental impacts of a wide range of installation activities and operations. This data should be actively incorporated into EMS at the planning stages. Although EIA terminology and focus often does not correspond to EMS terminology and focus, these barriers are in terminology not substance, and should be overcome.

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